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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/585,432

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EXAMINER

FIDLER, SHELBY LEE

ART UNIT

PAPER NUMBER

2861

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,432	SHIROTA ET AL.	
	Examiner	Art Unit	
	SHELBY FIDLER	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/7/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/7/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 7/7/2006 has been considered by the examiner.

Claim Interpretation - 35 USC § 112p6

Claim 11 appears to invoke the sixth paragraph of 35 U.S.C. 112 by providing means plus function language. The following table shows Examiner's interpretation of the disclosed structure that corresponds to this language:

<i>Means + Function Language</i>	<i>Corresponding Structure</i>
Print head control means	Head carrier control circuit 111
Position detection means	Sensor 31+ encoder 105
Print control means	CPU 110

Specification

The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text. Please delete the language found at the bottom of the abstract ("OAKLAND.1075571.1") so that the abstract is apart from any other text.

Also, the title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

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The following title is suggested: Printing Apparatus and Method for Reducing the Life Gap between Nozzles in a Print Head.

Claim Objections

Claim 3 is objected to because of informalities.

Regarding claim 3:

Please delete the colon following "wherein." Appropriate correction is required.

Regarding claims 7 and 9:

Please change "performed at the printing step" to "performed in the printing step" to place the claim in proper sentence format. A similar objection applies to "at the moving step" (claim 9).

Claim 8 recites the limitations "said head carrier" (line 10) and "said head carrier control circuit" (lines 10-11). There is insufficient antecedent basis for these limitations in the claim.

Claims 5-7 are objected to for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 5 and 6:

These claims state that the position detection circuit comprises a sensor and an encoder (and a slave roller, in the case of claim 6). However, it does not make sense to say that a circuit comprises these elements. Please clarify.

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Regarding claim 7:

This claim introduces "a print head" in the preamble, and also introduces "a predetermined ink nozzle head." In the context of the claim, Examiner is not sure whether Applicant intended these two elements to refer to the same head or different heads. This also leads to confusion as to which element later recitations of "said print head" are referring. Please clarify.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 9:

This claim states that "each time the print head is moved at the moving step, printing is performed at the printing step by using ink nozzles which are different at least partly from ink nozzles which were used for printing before the move." This scope of this limitation is difficult to discern. Examiner notes that the instant disclosure provides examples of the use of different nozzles during a given printing operation (Figs.6A-6E). However, in these examples, the nozzles used during the "last" printing step are the same as those used during the "first" printing step. This is in contrast to above limitation, since the nozzles must be different from nozzles which were used "before the

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move." Further, Examiner is not exactly sure what is meant by "before the move."

Does this refer to the movement made after the "first" printing step? Or does it refer to the movement made after the immediately preceeding printing step?

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto (US 5483268) in view of Dunand et al. (US 6068362).

Regarding claims 1, 7, and 12 (as best understood):

Fujimoto discloses an inkjet printer (Figs. 3-5) comprising:

a print head (1) having a plurality of ink nozzles (2) arranged in a direction perpendicular to a direction of feeding a print medium (Figs. 1, 3);

a print head control circuit (driving system) that drives the print head in the direction perpendicular to the direction of feeding the print medium (col. 5, lines 30-33);
and

a print control circuit (inherent to Figs. 2-5) that:

performs printing on a print area of width smaller than a maximum print width of the print head by using predetermined ink nozzles of the print head while moving the print medium relative to the print head (col. 3, lines 14-22),

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moves the print head in the direction perpendicular to the direction of feeding the print medium via the print head control circuit each time it has performed printing a predetermined number of times while moving the print medium (col. 3, lines 14-22), and

again performs printing on the print area by using ink nozzles that are different at least partly from the predetermined ink nozzles (col. 3, lines 22-27).

Fujimoto does not expressly disclose that the inkjet printer comprises a position detection circuit that detects a position of the print medium with respect to the print head.

However, Dunand et al. disclose a printer (40) that utilizes a position detection circuit (computer system 46) that detects a position of a print medium with respect to a print head, and that gives a very high resolution position signal able to precisely position ink droplets (col. 8, lines 43-64).

Therefore, at the time of invention, it would have been obvious and advantageous to a person of ordinary skill in the art to modify Fujimoto's printer to include the position detection circuitry disclosed by Dunand et al.

Regarding claims 2, 8, and 9:

Fujimoto's modified printer comprises all the limitations of claims 1/7, and **Fujimoto also discloses** that the print control circuit:

performs printing in a state that a position of the print head in the direction perpendicular to the direction of feeding the print medium is fixed (col. 3, lines 15-22

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states that the print head 1 is moved one dot at a time, thus it is fixed for the printing of each dot),

moves the print head via the print head control circuit in the direction perpendicular to the direction of feeding the print medium each time it has performed printing the predetermined number of times (e.g. printing of one dot as described in col. 3, lines 15-22), and

again performs printing in a state that the print head is fixed (col. 3, lines 15-24).

Regarding claim 3:

Fujimoto's modified printer comprises all the limitations of claim 1, and

Fujimoto also discloses that the print control circuit:

performs a control of moving the print head via the print head control circuit from an initial position (starting point described in col. 3, lines 15-22), at which printing on the print area is performed for a first time, to one end of movement (the head 1 having been displaced 16 dots as shown in Fig. 1) along the direction perpendicular to the direction of feeding the print medium while repeatedly printing on the print area (col. 3, lines 15-43 & Fig. 1), and

performs a control of moving the print head via the print head control circuit from the one end of movement to the initial position along the direction perpendicular to the direction of feeding the print medium while repeatedly performing the same printing on the print area (col. 3, lines 43-52 & Fig. 1).

Regarding claims 5 and 10 (as best understood):

Fujimoto's modified printer comprises all the limitations of claim 1, and
Dunand et al. also disclose that the position detection circuit comprises:

a sensor (41) that detects a mark (51) that is given on the print medium at predetermined intervals in the feeding direction (Fig. 5); and

an encoder (48) that detects an amount of the print medium being fed (col. 8, lines 43-48).

Regarding claim 6:

Fujimoto's modified printer comprises all the limitations of claim 1, and
Dunand et al. also disclose that the encoder comprises a slave roller (roller motor 43) that rotates while keeping in contact with a surface of the print medium (Fig. 5) and detects an angle of rotation by the slave roller (col. 8, lines 31-54).

Regarding claim 11:

Fujimoto discloses an inkjet printer (Figs. 3-5) comprising:

a print head (1) having a plurality of ink nozzles (2) arranged in a direction perpendicular to a direction of feeding a print medium (Figs. 1, 3);

a print head control means (driving system) that drives the print head in the direction perpendicular to the direction of feeding the print medium (col. 5, lines 30-33);
and

a print control means (inherent to Figs. 2-5) that:

performs printing on a print area of width smaller than a maximum print width of the print head by using predetermined ink nozzles of the print head while moving the print medium relative to the print head (col. 3, lines 14-22),

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moves the print head in the direction perpendicular to the direction of feeding the print medium via the print head control circuit each time it has performed printing a predetermined number of times while moving the print medium (col. 3, lines 14-22), and

again performs printing on the print area by using ink nozzles that are different at least partly from the predetermined ink nozzles (col. 3, lines 22-27).

Fujimoto does not expressly disclose that the inkjet printer comprises a position detection means for detecting a position of the print medium with respect to the print head.

However, Dunand et al. disclose a printer (40) that utilizes a position detection circuit (computer system 46) that detects a position of a print medium with respect to a print head, and that gives a very high resolution position signal able to precisely position ink droplets (col. 8, lines 43-64).

Therefore, at the time of invention, it would have been obvious and advantageous to a person of ordinary skill in the art to modify Fujimoto's printer to include the position detection circuitry disclosed by Dunand et al.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto as modified by Dunand et al., as applied to claim 1 above, and further in view of Shimada et al. (US 6547355 B1).

Regarding claim 4:

Fujimoto's modified printer comprises all the limitations of claim 1, **but does not expressly disclose** that the inkjet printer comprises a buffer memory.

However, Shimada et al. disclose a printer (22) comprising a buffer memory (115) that stores dot pattern data that is to be printed (col. 12, lines 21-23), wherein a print head control circuit (CPU 41) shifts a position at which the dot pattern data is expanded in accordance with movements of the print head (col. 16, lines 35-56 & Fig 20).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize the rasterizing techniques disclosed by Shimada et al. into Fujimoto's modified printer. Motivation for doing so, as provided by Shimada et al., is to correct dot formation positioning, thus providing a high-quality printing (col. 17, lines 61-67).

Conclusion

The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Kanazawa et al. (US 2002/0021323 A1) disclose an inkjet printer in which the print head is moved one pixel at a time in the main scanning direction to produce an image.

Vanhooydonck et al. (US 2003/0098898 A1) discloses an inkjet printer in which the print head is moved along the main scanning direction for printing, similar to the above cited Fujimoto.

Communication with the USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHELBY FIDLER whose telephone number is (571)272-8455. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW LUU/
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